

**AMENDMENTS TO THE DRAWINGS:**

Please replace the original drawing sheet depicting FIG. 3 with the attached replacement drawing sheet.

## **REMARKS**

### **I. Election/Restriction**

Applicants thank the Office for withdrawing the Restriction Requirement dated March 4, 2009.

### **II. Drawings**

The Office objects to Fig. 3 for allegedly failing to designate the drawing with a legend that complies with MPEP § 608.02(g). *See* Office Action at page 2. In particular, the Office alleges that Fig. 3 should be appropriately labeled as prior art. *Id.*

In response, Applicants have amended Fig. 3 to include the label, "Prior Art[.]" as shown in the attached replacement drawing sheet. In view of this amendment, Applicants respectfully request that the Office withdraw the objection to the drawings.

### **III. Specification**

The Office objects to the specification for allegedly lacking a brief description of Fig. 3. *Id.* Applicants respectfully disagree with the Office's position, at least because a description of Fig. 3 appears in the originally filed specification at page 4, lines 33-37. Furthermore, while the Rules *require* the specification of an application to include a brief description of the drawings, the Rules do not mandate the precise location of such a description within the specification. *See* 37 C.F.R. § 1.74 ("... there *shall* be a brief description of the several views of the drawings...."); 37 C.F.R. § 1.77(a) ("[t]he elements of the application... *should* appear in the following order...."). Accordingly,

Applicants respectfully submit that the as-filed specification complies with the U.S. rules.

Nonetheless, to expedite prosecution of this application, Applicants have inserted another brief description of Fig. 3 at page 23 of the specification. Support for the inserted description can be found, for example, at page 4, lines 23-36 of the as-filed specification and in original Fig. 3. Applicants therefore respectfully request that the Office withdraw the objection to the specification.

#### **IV. Status of the Claims**

Prior to the above amendment, claims 53-112 were pending. Without prejudice or disclaimer, Applicants have amended claims 53 and 106 for purposes of clarity, to recite wherein the at least one protective coating layer exhibits "a modulus of elasticity value between 5 MPa and 600 MPa over the range between -40°C and +60°C." The amendment neither narrows nor broadens the scope of the claims. Claim 83 has been amended to correct a typographical error, *i.e.*, to replace "monofunctional" with "monofunctional." Claim 93 has also been amended to correct a typographical error, *i.e.*, to replace "claims" with "claim." Claim 113 is a new independent claim, based on claim 53 and further reciting a relative refractive index value. Claims 53-113 are pending and under examination.

Section 112 support for the above amendments can be found throughout the as-filed specification and claims. For example, support for the amendments to claims 53 and 106 can be found at page 31, Table 4, wherein examples 1, 2, and 4-9 exhibit modulus of elasticity values that remain between 5 MPa and 600 MPa over the temperature range between -40°C and +60°C. Support for new claim 113 can be found,

for example, at page 8, line 36 to page 9, line 3. Applicants submit that the amendments raise no issue of new matter.

## **V. Response to Claim Rejections**

### **A. 35 U.S.C. § 103(a) rejection in view of Hale**

The Office rejects claims 53-60 and 106-111 under 35 U.S.C. § 103(a), as allegedly being unpatentable over U.S. Patent No. 5,822,489 to Hale ("Hale"). See Office Action at 3-5. The Office acknowledges that Hale does not teach the claimed range for the modulus of elasticity value recited in claim 53. *Id.* at 3. Nevertheless, the Office alleges that the pending claims are rendered obvious because Hale teaches values falling within the claimed ranged. *Id.* at 4. Applicants respectfully disagree, and traverse this rejection for at least the following reasons.

Several basic factual inquiries must be made in order to determine the obviousness or non-obviousness of claims of a patent application under 35 U.S.C. § 103. These factual inquiries, set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459, 467 (1966), require the Examiner to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or nonobviousness of the claimed invention is then evaluated in view of the results of these inquiries. *Graham*, 383 U.S. at 17-18, 148 U.S.P.Q. at 467; *see*

also *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1730, 82 U.S.P.Q.2d 1385, 1388 (2007).

Indeed, to establish a *prima facie* case of obviousness, the Office must:

make a determination whether the claimed invention “as a whole” would have been obvious at that time to that person. Knowledge of applicant’s disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the “differences,” conduct the search and evaluate the “subject matter as a whole” of the invention. The tendency to resort to “hindsight” based upon applicant’s disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

M.P.E.P. § 2142. “The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious.”

*Id.* Moreover, each prior art reference relied upon in a rejection “must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention.” M.P.E.P. § 2141.03(VI) (emphasis in original); *see also Graham*, 383 U.S. at 17, 148 U.S.P.Q. at 467.

As explained above, claims 53 and 106 have been amended to recite “at least one protective coating layer having a modulus of elasticity value between 5 MPa and 600 MPa over the range of -40°C and +60°C.” That is, the at least one protective coating layer of the pending claims exhibits modulus of elasticity values as a *continuum*, between 5 MPa and 600 MPa over the entire temperature range (*e.g.*, as the temperature shifts from -40°C and increases to +60°C).

Applicants contend that Hale fails to teach or suggest protective coating layers that exhibit a modulus of elasticity value that remains between 5 MPa and 600 MPa over the claimed temperature range between -40°C and +60°C.

First, while Hale arguably describes elastic modulus values at a single temperature (23°C) (*see, e.g.*, col. 3, lines 9-11), Applicants understand that Hale teaches unrelated modulus values. Hale describes "an elastic modulus of about 12 Mpa measured at a strain rate of 0.1%/min at room temperature (23°C)." *See, e.g.*, Hale at col. 3, lines 9-1 (emphasis added). However, the claimed modulus of elasticity value is "intended as '**tensile modulus**' and [is] measured using a DMTA apparatus (Dynamic Mechanical Thermal Analyser)." *See* specification at page 8, lines 29-35 (emphasis added). It is Applicants' understanding that these are unrelated modulus values that are not predictive of the claimed modulus of elasticity values. Accordingly, Hale does not teach or suggest a composition with the claimed properties.

Additionally, Applicants submit that since Hale does not teach or suggest the claimed modulus of elasticity values, it does not recognize them as result-effective variables. When the cited art does not recognize a variable as being result effective, the Office is **precluded** from arguing that it would have been obvious to optimize such variables. *See* M.P.E.P. § 2144.05 (II)(B) ("A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.") In this very context, the M.P.E.P. explains that "[o]bviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a certain feature is later established."

M.P.E.P. § 2144.02(V) (following discussion of *In re Antoine*'s finding of no obviousness due to prior art's failure to recognize a certain parameter, and therefore, no basis to optimize it.). None of the secondary references remedy the deficiencies set forth above.

Second, even assuming *arguendo* that Hale's modulus values are the same as the claimed values, Hale does not teach or suggest what elastic modulus values its compositions may exhibit over a broad temperature range (e.g., between -40°C and +60°C). According to the M.P.E.P., "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." M.P.E.P. § 2112 (citation omitted). Indeed the M.P.E.P. advises that "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Id.* (citing *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original)). The fact that a composition exhibits a certain modulus value at a single temperature, such as 23°C, cannot predict the modulus values over a broad temperature range such as between -40°C and +60°C. In other words, a composition that meets the limitation at one temperature may or may not meet the limitation over the entire temperature range, and therefore, the property cannot be inherent in Hale and its compositions. See, e.g., *Akzo N.V. v. U.S. Int'l Trade Comm.*, 1 U.S.P.Q.2d 1241, 1425 (Fed. Cir. 1986) (affirmed that even though the prior art disclosure of "sulfuric acid" encompassed the claim term "98% concentrated sulfuric acid," it is only a mere probability and not an inherent disclosure of "98% concentrated sulfuric acid."); *Mehl/Biophore Int'l Corp. v. Milgraum*, 52 U.S.P.Q.2d 1303, 1306 (Fed. Cir. 1999) (even

though the prior art laser was clearly either aligned or not aligned with the hair follicle, the mere possibility that it could be aligned, as required by claim, was not enough to apply the doctrine of inherency).

Not only is this seen in the prior art examples of Figure 3, it is also seen in Table 4. Specifically, Example 1 and comparative Example 11\*, as described in Table 4 of the as-filed specification, each exhibit modulus of elasticity values that are similar when measured at 25°C (*i.e.*, 50 MPa and 60 MPa, respectively). However, the attenuation of an optical fiber comprising the coating of comparative Example 11\* would be remarkably higher than a fiber having the coating of Example 1, as the modulus of elasticity value for the Example 11\* coating is about **1,300 MPa greater** than the value exhibited by Example 1 (1600 MPa versus 300 MPa) when measured at -40°C. The 1600 MPa modulus of elasticity value for Example 11\* falls far outside of the 5 MPa and 600 MPa range recited in the pending claims. In view of that, Applicants submit that it is not possible to extrapolate out the modulus of elasticity values for a certain composition over a broad temperature range by simply observing a single modulus value (*e.g.*, 12 MPa) at a single temperature (*e.g.*, 23°C).

With regard to new claim 113, Hale does not teach or suggest a "protective coating layer [that] has a refractive index at room temperature higher than the refractive index of the glass portion." Rather, Hale teaches that its refractive index is smaller than that of the glass core. *See, e.g.*, Hale at Abstract.

In view of the foregoing arguments, Applicants submit that the Office's 35 U.S.C. § 103(a) rejection in view of Hale is not tenable, and should be withdrawn.



**B. 35 U.S.C. § 103(a) Rejection in view of Komiya**

The Office rejects claims 53, 61-106 and 112 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,528,553 to Komiya et al. ("Komiya"). *Id.* at 5-16. Applicants disagree with and traverse this rejection for at least the following reasons.

- 1. With respect to claims 68-105 and 112, Komiya fails to teach or suggest ethylenically unsaturated polyurethanes that exhibit a glass transition temperature ( $T_g$ ) between -40°C and -100°C.**

According to the Office, Komiya discloses a " $T_g$  between -70°C and -30°C." *See* Office Action at 6. While the Office admits that Komiya does not expressly disclose the claimed  $T_g$  range of "between -40°C and -100°C," the Office alleges that Komiya discloses an overlapping range that renders the pending claims obvious. *Id.* Applicants respectfully disagree for at least the following reasons.

First, Applicants note that the  $T_g$  range between -40°C and -100°C recited in claims 68, 94 and 112 relates specifically to the recited ethylenically unsaturated polyurethane component. Thus, the  $T_g$  range recited in the pending claims is a characteristic of the polyurethane component *alone*, and not the radiation curable composition as a whole.

With this in mind, the Office's reliance on column 11, lines 10-13 and 25-30 of Komiya - which describe glass transition temperatures for a composition after cure - is inapposite to the "... radiation curable composition comprising... at least one ethylenically unsaturated polyurethane having a glass transition temperature ( $T_g$ ) between -40°C and -100°C..." recited in claims 68, 94, and 112. *See Komiya* at col. 11,

ll. 9-12 ("[t]he *radiation curable composition* of the present invention may be formulated such that the composition after cure has a  $T_g$  between  $-70^{\circ}\text{C}$  and  $30^{\circ}\text{C}$ "). This fact is reinforced by other portions of Komiya. See, e.g., *id.* at col. 11, ll. 28-33 and Table 3. Moreover, Komiya fails to discuss the  $T_g$  characteristics of any individual components (e.g., polyurethanes) within its cured compositions, and does not teach or suggest a radiation curable composition comprising at least one ethylenically unsaturated polyurethane within the scope of the pending claims.

Second, Komiya does not disclose a "radiation *curable* composition comprising ... at least one ethylenically unsaturated polyurethane having a glass transition temperature...." within the ranges recited in claims 68, 94, and 112. Rather, Komiya discloses  $T_g$  values relating to *cured* compositions. See *id.* at col. 11, ll. 28-33 and col. 12, 53-60 and Table 3. Thus, Komiya's  $T_g$  values, which relate to cured compositions, are inapposite to the claimed radiation *curable* composition.

In sum, Komiya fails to teach or suggest radiation curable compositions having ethylenically unsaturated polyurethane components that exhibit a  $T_g$  of any particular value, let alone the  $T_g$  range recited in claims 68, 94 and 112. And while Komiya arguably describes the  $T_g$  values of certain *cured* compositions, it fails to expressly or implicitly describe  $T_g$  values for any individual polyurethane components comprised within *curable* (i.e., pre-cured) compositions. Further, Komiya fails to explain or otherwise suggest how or why a skilled artisan would be motivated to prepare radiation curable compositions comprising ethylenically unsaturated polyurethanes exhibiting the specific glass transition range recited in pending claims 68, 94 and 112.

For at least the foregoing reasons, Applicants submit the 35 U.S.C. § 103(a) rejection of claims 68-105 and 112 in view of Komiya is not tenable, and should be withdrawn.

2. **With respect to claims 53, 61-93, 106, and 112, Komiya's compositions do not inherently meet the claimed "at least one protective coating layer having a modulus of elasticity value between 5 MPa and 600 MPa over the range of -40°C and +60°C."**

The Office contends that the range of "between 5 MPa and 600 MPa" recited in claims 53 and 106 would have been obvious because is falls within the range "between 0.1 MPa and 2000 MPa" described in Komiya. *Id.* at 5. Yet, even if true, that is insufficient to render the claims obvious.

As discussed above with respect to Hale, claims 53 and 106 have been amended to recite "at least one protective coating layer having a modulus of elasticity value between 5 MPa and 600 MPa over the range of -40°C and +60°C." Yet, Komiya fails to teach or suggest protective coating layers that exhibit a modulus of elasticity value between 5 MPa and 600 MPa over the claimed temperature range. While Komiya arguably describes elastic modulus values at a *single* temperature (23°C) (*see, e.g.*, col. 12, lines 61-63), Komiya does not explain or suggest what elastic modulus values the compositions described therein may exhibit over a broad temperature range (*e.g.*, between -40°C and +60°C). In that same vein, as discussed above, a person of ordinary skill in the art would not be able to glean any information regarding the elasticity values of those compositions over a broad temperature range by simply observing the modulus values reported for a single temperature (*i.e.*, room

temperature). Thus, whether or not Komiya's products meet the limitation is a matter of chance.

According to the M.P.E.P., "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." M.P.E.P. § 2112 (citation omitted). Indeed the M.P.E.P. advises that "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Id.* (citing *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original)). Hence, the compositions of Komiya do not inherently meet this limitation.

**3. Komiya teaches away from the claimed range of "between 5 MPa and 600 MPa"**

Again, the Office contends that the range of "between 5 MPa and 600 MPa" recited in claims 53 and 106 would have been obvious because it falls within the range "between 0.1 MPa and 2000 MPa" described in Komiya. *Id.* at 5. However, Komiya fails to provide any information explaining how or why a person of ordinary skill in the art would produce coatings having a modulus of elasticity remaining between 5 MPa and 600 MPa over the claimed temperature range. To the contrary, consideration of Komiya's disclosure as a whole would have lead one of ordinary skill away from coatings exhibiting the claimed characteristics.

Applicants contend that the properties of the exemplary compositions prepared and tested in Komiya actually teach away from compositions that exhibit a modulus of

elasticity remaining between 5 MPa and 600 MPa over the range of -40°C and +60°C. In describing its invention, Komiya stresses that a modulus “in the lower range” is preferable. *Komiya* at col. 10, ll. 65-67. Indeed, Komiya expressly states that the ideal range is “more preferably 0.5 to less than 3 MPa.” *Id.* at col. 11, l. 1. Komiya reemphasizes its preference for low modulus materials in the disclosed example compositions. *See id.* at column 11, line 48-column 17, line 23 and Tables 1-4. Indeed, as discussed below, none of Komiya’s exemplary compositions exhibit a Young’s modulus value of greater than about 1.7 MPa. *See id.* at Tables 1-4 (wherein the conversion of 1 Kg/mm<sup>2</sup> = 9.8 MPa). For example, Komiya reports the modulus of elasticity (E) for two different cured compositions, Examples 1 and 2, in Table 3. As shown in Table 3, the Example 1 and 2 compositions of Komiya exhibited Young’s modulus values of **0.7 and 1.10 MPa**, respectively.

Komiya further reports the modulus values for *nine* additional compositions, which cover the narrow range of 0.08 to 0.17 Kg/mm<sup>2</sup> (about **0.8 to 1.7 MPa**). *Id.* at Table 4. Thus, each and every one of Komiya’s exemplary compositions exhibit Young’s modulus values well below the low endpoint of 5 MPa recited in the pending claims.

Applicants further submit that Komiya’s express preference for a low-range modulus, coupled with the disclosure of myriad compositions exhibiting Young’s modulus values well below 5 MPa (*i.e.*, 1.7 MPa or less), would lead a skilled artisan away from the compositions of the pending claims. Applicants therefore submit that claims 53 and 106, and the corresponding dependent claims, are patentable over

Komiya. For at least these additional reasons, the Office's 35 U.S.C. § 103(a) rejection in view of Komiya is not tenable, and should be withdrawn.

**VI. Conclusion**

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

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